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ABSTRACT

This study examined the effects of a course in educational psychology on the epistemological beliefs of preservice teachers. Participants were preservice teachers enrolled in educational psychology and a control group of students recruited from other classes. The Epistemological Beliefs Scale, which measures beliefs about the nature of knowledge and learning across four dimensions (knowledge is certain, knowledge is simple, learning is quick, and ability to learn is fixed) was administered at the beginning and end of a semester-long class and again at the end of the following semester. The epistemological beliefs of the preservice teachers were found to be no more naive, on average, than those of the other students. Short-term change occurred across all four dimensions, with the greatest amount of change in the 'knowledge is simple' and 'learning is quick' dimensions. Although not all changes were maintained over time, long-term changes in beliefs about the simplicity of knowledge and the certainty of knowledge may be related to the course content and methods of instruction. (Author/SM)

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Running Head: Educational Psychology and Epistemological Beliefs

The Effects of a Course in Educational Psychology on Pre-service Teachers' Epistemological Beliefs

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Poster presented at the American Educational Research Association Annual Meeting

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Abstract

This study examined the effects of a course in Educational Psychology on the epistemological beliefs of pre-service teachers. Participants were pre-service teachers enrolled in Educational Psychology and a control group of students recruited from other classes. The Epistemological Beliefs Scale, which measures beliefs about the nature of knowledge and learning across four dimensions (knowledge is certain, knowledge is simple, learning is quick and ability to learn is fixed) was administered at the beginning and end of a semester-long class and again at the end of the following semester. The epistemological beliefs of the pre-service teachers were found to be no more naïve, on average, than those of the other students. Short-term change occurred across all four dimensions, with the greatest amount of change on the 'knowledge is simple' and 'learning is quick' dimensions. Although not all changes were maintained over time, long-term changes in beliefs about the simplicity of knowledge and the certainty of knowledge may be related to the course content and methods of instruction.

The Effects of a Course in Educational Psychology on Pre-service Teachers' Epistemological Beliefs

Research on the relationships among beliefs, behavior and outcomes is growing in the field of teacher education. There is ample evidence that teachers' beliefs about the nature of knowledge and learning affect their teaching practices, which in turn, influence students' beliefs (Kagan, 1992). Although there are many ways of conceptualizing epistemological beliefs, a useful organization is reflected in Schommer's Epistemological Belief Scale (1993a) which includes questions about 1) the complexity of knowledge, 2) the mutability of knowledge, 3) the amount of control a learner has over the learning process, and 4) the speed of learning (these are based on work by Perry, 1969; Dweck & Leggett, 1988; and Schoenfeld, 1983).

Some research indicates that college students who plan to become teachers tend to have relatively naive epistemological beliefs compared to other college students (Schommer 1993a). That is, compared to other students, they tend to believe that knowledge is a collection of discrete bits, that truth is unchanging, that learning ability cannot be changed and that learning occurs quickly or not at all. This raises an important question: Do education classes promote such beliefs or simply fail to challenge existing beliefs? One class likely to lead to conceptual change in epistemological beliefs is educational psychology, although not all educational psychology is in line with sophisticated epistemological beliefs (for example, we tend to view intelligence as relatively fixed).

The current study poses three questions: 1) Are the epistemological beliefs of education majors more naive than those of other college students? 2) Will students' epistemological beliefs change over the course of a semester-long class in educational psychology? And finally, 3) if changes occur, are they temporary or permanent?

Method

Participants

Participants were 103 college students, most of whom were female, white, and of traditional college age. Fifty of the students were enrolled in one of two sections of Educational Psychology, both taught by the first author. The control group of 53 students was recruited from other psychology classes.

Procedure and Measures

At the beginning of the fall semester each participant was given a survey which included a demographic information questionnaire and The Epistemological Beliefs Questionnaire (EBS, Schommer, 1993a) described below. Students in the Educational Psychology class were re-administered the EBS in December, at the end of the semester and 30 of the Educational Psychology students and 53 control group participants were re-administered the EBS in May. Thus data were collected over the entire academic year, at three points for the Educational Psychology students and at two points for the control group.

The Epistemological Beliefs Questionnaire (EBS). The EBS is designed to assess the relative naiveté or sophistication of respondents' beliefs across four broad epistemological dimensions, stated here from a naive perspective: Knowledge is simple, knowledge is certain, learning is quick and the ability to learn is fixed. Each of these four factors includes three subscales yielding a total of 63 items and 12 subscales (see Table 1). Subscale scores were created by averaging items, rated on 5 point scales, with lower numbers corresponding to more sophisticated beliefs.

Educational Psychology Class. Class met three times a week for 13 weeks. Instructional methods included lecture, small group integration activities and whole class

discussion. Weekly homework assignments were given which emphasized application of new concepts to educational settings. Nine chapters from Crowl, Kaminsky and Podell (1997) *Educational Psychology: Windows on Teaching* were assigned. We covered the following topics:

- Behavioral approaches to learning
- Cognitive development, including the work of Piaget, Vygotsky & Bruner
- Cognitive approaches to learning with emphases on conceptual knowledge, metacognition and comprehension
- Problem solving and critical thinking
- Language acquisition and the influence of language and culture on learning
- Intelligence and creativity
- Social development and the importance of peers
- Cognitive approaches to motivation, including teacher motivation and teacher expectations

Results

To answer the question of whether a class in Educational Psychology influences student's epistemological beliefs, t-tests were run for each of the 12 sub-subscales of the EBS comparing the student's responses at the beginning of the class to those at the end of the class. The results are presented in Table 1. The mean score for ten of the 12 subscales decreased from time 1 to time 2, and in 6 cases these changes were statistically significant.

In order to answer the question of whether these changes would be maintained over time, ANOVAs were performed on the data collected from both the Educational Psychology students and the control group comparing students' responses in September and in May.

These results are presented in Table 2. Three of the six subscales which had shown significant change over the fall semester remained significantly lower. The other three scores had returned to close to their initial level. There does not appear to be a significant difference in the initial naiveté of the beliefs of pre-service teachers and other college students. The interaction effects appear to be caused by greater decreases in the naiveté of the educational psychology students compared to the students in the control group.

Discussion

The Epistemological Beliefs Scale (EBS, Schommer, 1993a) was used to assess pre-service teachers' epistemological beliefs at the beginning and end of a course in Educational Psychology and then again at the end of the following semester. The students' responses on many of the questions on the EBS did change in ways that can be related to the course content. The most significant changes occurred on two dimensions: Knowledge is Simple, and Learning is Quick, both of which are closely related to the current trend in Educational Psychology toward constructivism, which conceives of learning as a gradual, effortful process with knowledge constructed by active learners into complex, interconnected schemata. Fewer changes were obtained in the Knowledge is Certain dimension. Although we do try to teach our students that knowledge evolves and can best be understood in context, the field of education as a whole is oriented toward teaching a body of knowledge which is valued in our culture and which we, as teachers, tend to accept as fact. The Ability to Learn is Fixed dimension is problematic because of the way in which the items cover both intelligence and learning strategies. In the field of educational psychology, study skills and cognitive strategies are viewed as learnable and flexible, while intelligence is viewed as somewhat malleable by experience but also constrained by genetic inheritance. The Epistemological

Belief Scale does not distinguish between learning abilities that can be changed and those that cannot.

Two subscales, Avoid Ambiguity and Depend on Authority showed relatively long lasting change over time which may be linked to the Educational Psychology class. This indicates that students acquired a greater tolerance for questions with complex answers and a greater ability to reason for themselves rather than turn to their parents or their teachers for answers. While these two characteristics seem important for future teachers, it would have been gratifying to have found long term changes in more areas of the students' epistemological beliefs. It is possible that while students are in their Educational Psychology course they are prone to think psychologically but that once they leave the course they revert back to their "old ways" of thinking.

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Table 1.
Means for each of the 12 EBS subscales for Educational Psychology Students in September and December

	Time of testing	
Factors and sub-scales	September	December
Knowledge is simple		
Seek Single Answers	2.90	2.88
Avoid Integration*	**2.48**	**2.35**
Avoid Ambiguity*	**3.09**	**2.94**
Knowledge is Certain		
Knowledge is Certain	2.48	2.38
Depend on Authority***	**3.25**	**2.93**
Don't Criticize Authority	2.06	2.10
Learning is Quick		
Learn the First Time**	**2.20**	**1.96**
Learning is Quick**	**1.98**	**1.79**
Effort is a Waste of Time	2.40	2.22
Ability to Learn is Fixed		
Learning is Innate	2.59	2.66
Can't Learn to Learn***	**2.34**	**2.04**
Success is Unrelated to Hard Work	2.08	1.95

N=50
Based on a 5-point scale, lower scores reflect more sophisticated beliefs
*p<.05, **p<.01, ***p<.001

Table 2.
Means for each of the 12 EBS subscales for Educational Psychology Students and Control Group in September and in May

	Time of Testing			
	September		May	
Sub-scale	Ed Psych	Control	Ed Psych	Control
Knowledge is Simple				
Seeks Single Answers	2.90	2.95	2.84	2.90
Avoid Integration*	**2.45**	**2.77**	**2.25**	**2.68**
Avoid Ambiguity**	**3.07**	**2.91**	**2.86**	**3.02**
Knowledge is Certain				
Knowledge is Certain	2.53	2.45	2.56	2.41
Depend on Authority***	**3.22**	**3.11**	**2.90**	**3.12**
Don't Criticize Authority	2.06	2.28	2.23	2.29
Learning is Quick				
Learn the First Time2.24	2.15	2.08	2.22	
Learning is Quick	2.04	2.15	1.98	2.19
Effort is a Waste of Time	2.40	2.36	2.28	2.29
Ability to Learn is Fixed				
Learning is Innate	2.60	2.61	2.55	2.71
Can't Learn to Learn	2.32	2.18	2.30	2.30
Success is Unrelated	2.17	2.22	2.19	2.25

Note: N of Educational Psychology = 30, N of Control Group = 53
Based on a 5-point scale, lower scores reflect more sophisticated beliefs
*significant change over time for both groups
**significant interaction
***significant change over time for both groups and significant interaction